

GreenEye Monitor

WiFi/Ethernet Setup



Document Code: GEM-SET-WE-2

Ver 6.2

2017-10-09

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INTRODUCTION

This manual describes the procedure for setting up communication for a GEM having the **WiFi/Ethernet** option (GEM-WE).

THE COMMUNICATION MODULE

The GEM has a separate communication module with its own dedicated processor to provide **WiFi** or **Ethernet** communication. Because of this, there will be two setup web interfaces:

- WiFi/Ethernet setup page
- GEM setup page

START-UP SEQUENCE

The GEM is powered up when the 5VDC power adapter is plugged into an outlet and to the GEM (Figure 1).

When the GEM is powered up, the “**Communication Status LED**” (Figure 2) will remain dark (off) for approximately 6 seconds. This is the time required for the communication module to boot up and create or join a network. Once the module is booted the LED will turn **AMBER**. If there is a WiFi connection to the GEM, the LED will change from **AMBER** to **YELLOW**.

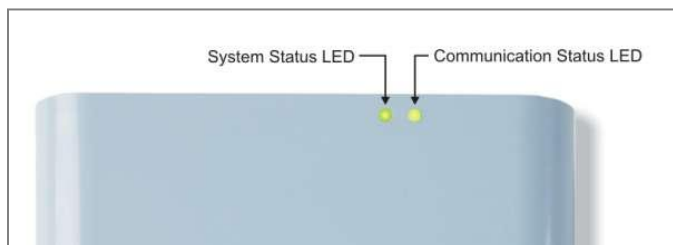


Figure 2 GEM LEDs

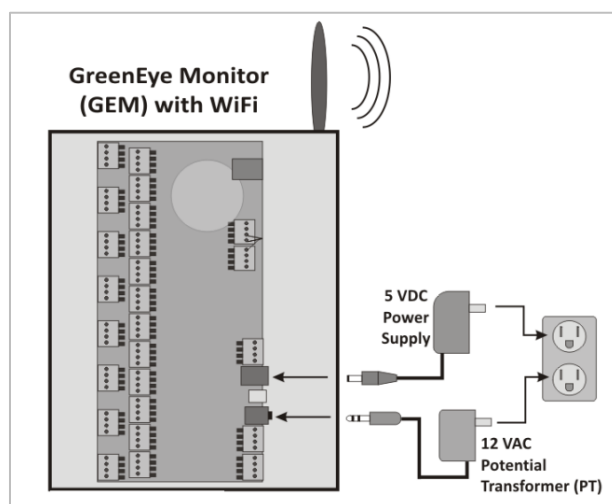


Figure 1 5VDC Power and PT Connection

The “**System Status LED**” (Figure 2) will be **GREEN** unless a PT is not connected. If there is no PT signal this LED will flash **RED** on-off continuously. **Note:** The PT signal is not required when setting up the GEM communication.

COMMUNICATION STATUS LED

The “**Communication Status LED**” (Figure 2) will glow **AMBER** (orange) or **YELLOW**.

Dark: The communication module is booting up.

AMBER: Communication module is active but there is no WiFi connection although there may be an Ethernet connection.



YELLOW: The module has a WiFi connection in AP or STA mode.



Note: If using Ethernet cable connection, the LED will remain **AMBER** regardless of whether or not there is a connection.

HARDWARE

The WiFi antenna connector

The antenna screws on to the **antenna connector**. It is a 3dBi RP-SMA type. If the antenna location is in a bad area and range or interference issues arise, you can order an antenna extension to position the antenna for optimum signal.

The Ethernet cable connection

The Ethernet jack is a standard RJ-45 type.

Note: There are no activity LEDs on this jack

Factory default reset switch

This push button switch is used to reset the WiFi/Ethernet settings to its factory default values. Push the switch button for approximately 5 seconds to reset.



WIFI SECURITY

By default the GEM's WiFi Access Point (AP) is unsecured. This is equivalent to having a network router with no password protection. Once the GEM has a connection to your network via WiFi or Ethernet cable, your network would be open to anyone within WiFi range since the open AP is bridged to your network. This issue is resolved by enabling WiFi security.

How to Setup Security

Note: Although the following steps refer to using a personal computer (PC), a Laptop, Tablet or Smart Phone may be used instead.

The GEM creates WiFi network called "**GreenEye_xx**" where "**xx**" may be any two characters. The goal is to connect to the GEM's access point (AP) with a PC. The steps are described below:

1. Make sure the WiFi antenna is installed on the GEM. Connect the 5Vdc power supply to the GEM (Figure 4). After six seconds the Communication LED will come on and glow **AMBER** (orange). It is not required to have the **PT** (12Vac wall transformer) plugged in at this point. If the PT is connected, the "**System**" LED will glow **GREEN** otherwise it will be flashing **RED**.



Figure 3

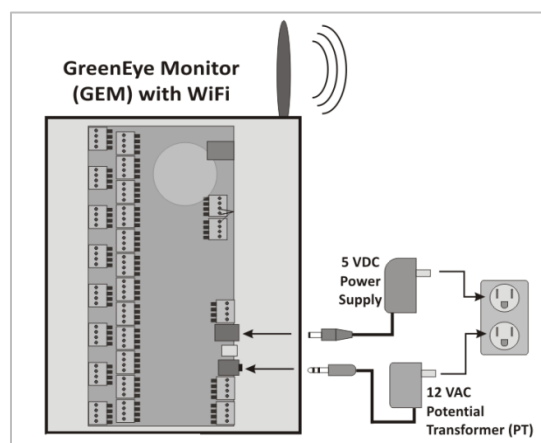


Figure 4

2. Use the PC to search for a wireless network named "**GreenEye_xx**" (where the two "**xx**" could be any two characters). See Figure 5. If you have more than one WiFi/Ethernet GEM operational, you will probably see more than one "**GreenEye_xx**" network. If this is the case, unplug the other GEM(s) until you're done with the current GEM. Connect to this WiFi network. Once you have established a connection the Communication LED of the GEM will change from **AMBER** to **YELLOW**. Your device is now connected to the GEM.

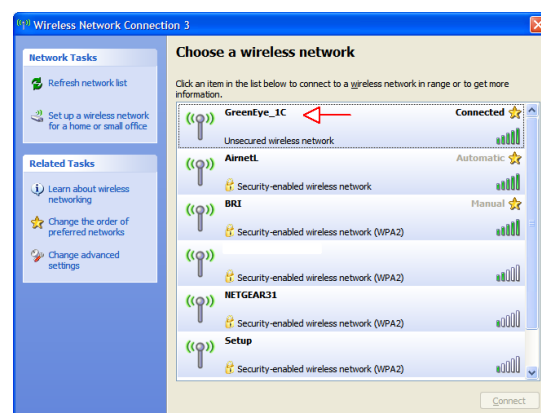


Figure 5

- Using your connected device, open a web browser and enter the IP address “1.2.3.4” (you may need to use “http://1.2.3.4”). You will be prompted for a Username and Pass Phrase. Use “admin” for both. See Figure 6.

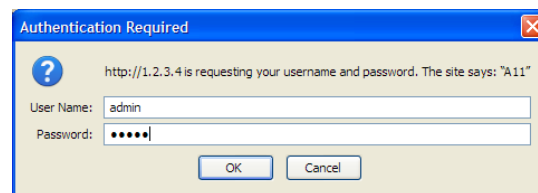


Figure 6 Enter "admin" for User and Password

- On the side menu (left), click “AP Interface Settings”. This will open the “AP Interface Setting” (Figure 7). If you wish to replace “GreenEye_xx” with a different SSID (1), you may enter the new SSID in this field. The new SSID must not have any spaces or special characters. In this example “Sub_Panel_GEM” was used. This is the SSID that will be displayed when you search for wireless networks. Click “Apply” (2). Disregard the “Set Successfully” page (Figure 8). Click “AP Settings” from the menu.

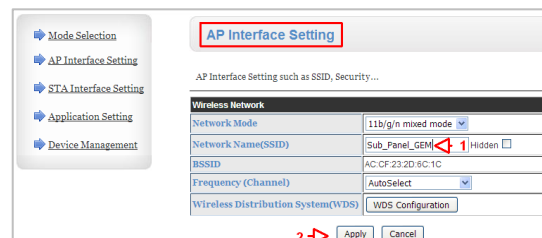


Figure 7

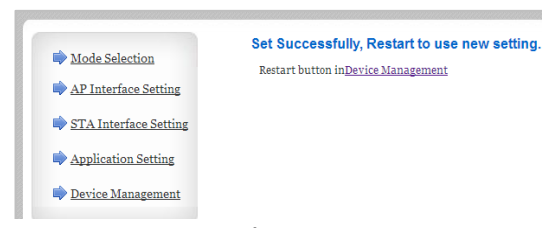


Figure 8

- The screen on the right shows the “AP Interface Settings” screen once again. Set the “Security Mode” to “WPA2-PSK” (1). Set the “WPA Algorithm” (2) to “AES”. Enter a password (3). Remember to obey the rules for password such as no spaces or reserved characters. The password is also case sensitive. Click “Apply”.

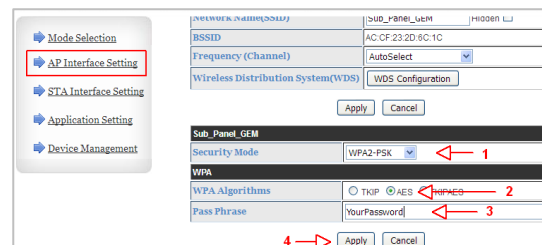


Figure 9

- Click “Device Management” (Figure 10) from the menu (1). Click “Restart” (2). The GEM will now save the changes and re-boot the communication module. Wait approximately 30 seconds. If you modified your SSID search for the new SSID and connect to it. Remember that you will now need to use the new Pass Phrase.

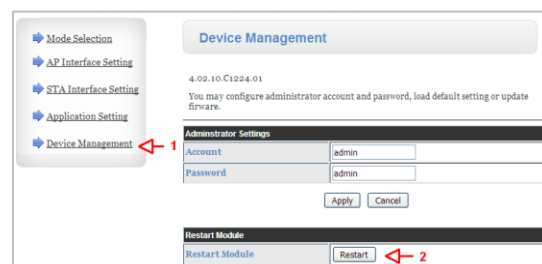


Figure 10

The GEM now has a secure connection. **BEWARE: Anytime the GEM’s WiFi Ethernet module is reset to the factory default settings, the WiFi security will reset to unsecure!**

CONNECTION METHOD

Determine the connection method: **WiFi** or **Ethernet cable**. See diagram for each method (below).

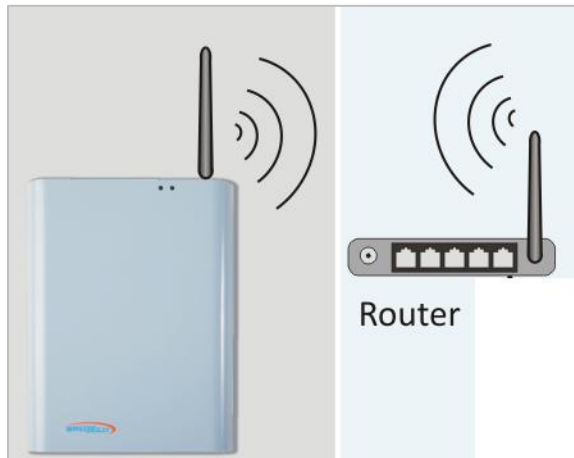


Figure 11 The GEM is connected via WiFi

WiFi Connection

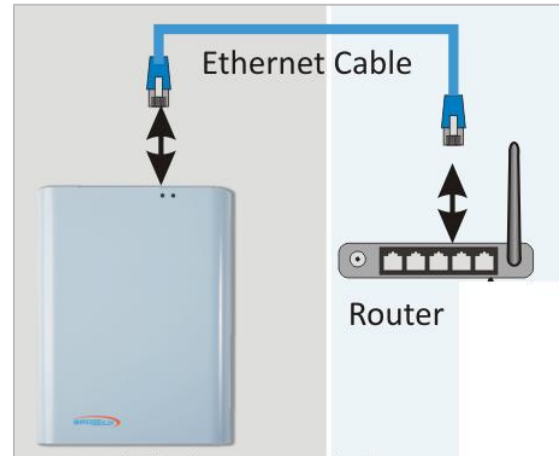


Figure 12 The GEM is connected to the network using an Ethernet cable

Ethernet Cable Connection

Proceed to the chapter “**WiFi Connection**” OR “**Ethernet Connection**”, whichever method you will be using.

WIFI CONNECTION

If you are connecting the GEM to the network using an Ethernet cable, skip this section and proceed to the “**Ethernet Connection**” chapter.

Make sure you **do not** have an Ethernet cable connected when using WiFi connection. Having completed the Security Setup, you should be connected to the GEM with your device (PC, Laptop, Tablet or Phone). If you are not connected, search the SSID that you have given the GEM and connect to it.

WIFI CONNECTION BETWEEN GEM & NETWORK

1. Open a web browser and enter the IP address “**1.2.3.4**” (you may need to use “**http://1.2.3.4**”). You will be prompted for a Username and Password. Use “**admin**” for both. (Figure 13)

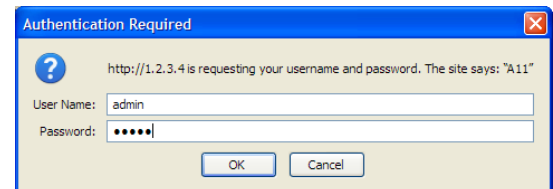


Figure 13

2. Refer to Figure 14. On the main page, select “**STA Mode**” (1) then click “**Apply**” (2). You will be prompted to select the “**Device Management**” page and to restart the module. **DO NOT DO THIS AT THIS TIME!**

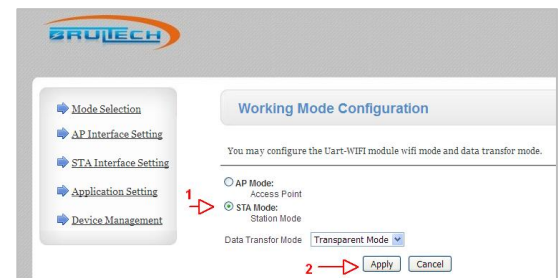


Figure 14

3. On the side menu (left), click “**STA Interface Settings**” (1). This will open the “**STA Interface Parameters**” box (Figure 15). Click “**Search**” (2). A “**Site Survey**” window (Figure 16) will open displaying the WiFi network(s) in range. Find the network you wish the GEM to connect to. Click the radio button to the left of the desired network. Click “**Select**” at the bottom of the site survey page. A box will open prompting you to “**Please Input Key!**”. Click OK.

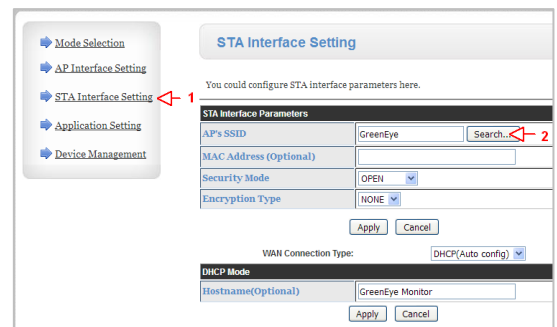


Figure 15

<input type="radio"/>		5c:1c:86:92:84:b3	20%	1	AES	WPA2PSK	Infrastructure
<input type="radio"/>		58:0a:20:91:32:61	24%	1	TKIP	WPA2PSK	Infrastructure
<input type="radio"/>		58:0a:20:91:32:63	15%	1	AES	WPA2PSK	Infrastructure
<input type="radio"/>	NETGEAR31	a4:2b:8c:0e:47:be	0%	6	AES	WPA2PSK	Infrastructure
<input checked="" type="radio"/>	BRI	00:1c:f0:4d:8e:da	100%	6	TKIP	WPA2PSK	Infrastructure
<input type="radio"/>		58:0a:20:91:89:51	15%	11	TKIP	WPA2PSK	Infrastructure

Figure 16 Site Survey

- Refer to Figure 17. Enter the “**Pass Phrase**”(1) which is the password of the WiFi network you are connecting to. **Set the encryption to “AES”** (2). Although “TKIP” is shown in the site survey, TKIP does not function properly. Click “**Apply**” (3).

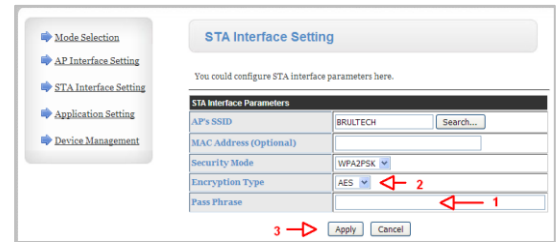


Figure 17

- After clicking “**Apply**”, the window in Figure 18 will be displayed. Click “**Device Management**”

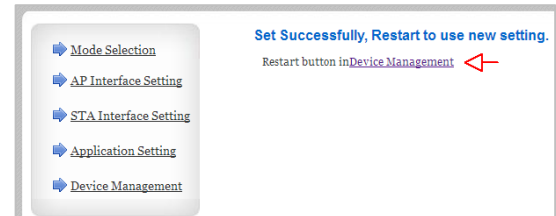


Figure 18

- The “**Device Management**” page is displayed in Figure 19. Click “**Restart**” and proceed to the next step. Wait approximately 30 seconds for the module to save settings and reboot.

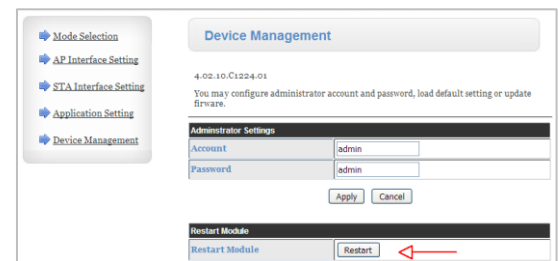


Figure 19

- Connect your PC to the same network the GEM is now connected to. Doing so will automatically disconnect your device from the GEM AP. Once you have completed this, verify that the “**Communication LED**” of the GEM is glowing **YELLOW**. This indicates a successful WiFi connection between the GEM and your network. If the LED is glowing **AMBER**, that would indicate that the GEM has not connected to your WiFi network.

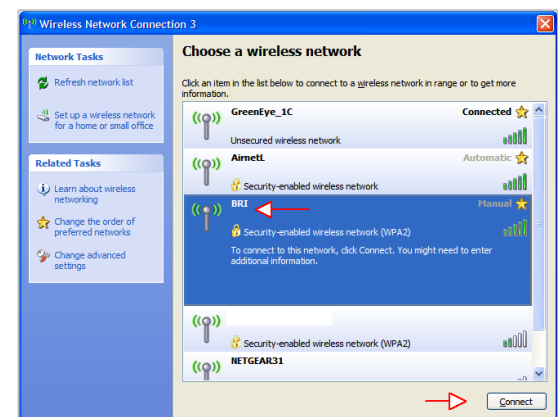


Figure 20

Skip over the next chapter (Ethernet Connection) and proceed to “**Discover GEM’s IP Address**” chapter.

ETHERNET CONNECTION

Skip this chapter if you are using WiFi to connect the GEM to the network!

This section describes how to connect the GEM to the network using an Ethernet connection instead of WiFi. (see Figure 21)

Do not attempt to connect to the network using Ethernet and WiFi at the same time as this will cause strange behaviours.

Note: *An Ethernet cable is not included in your kit because the required length will vary based on the distance between the GEM and your network router.*

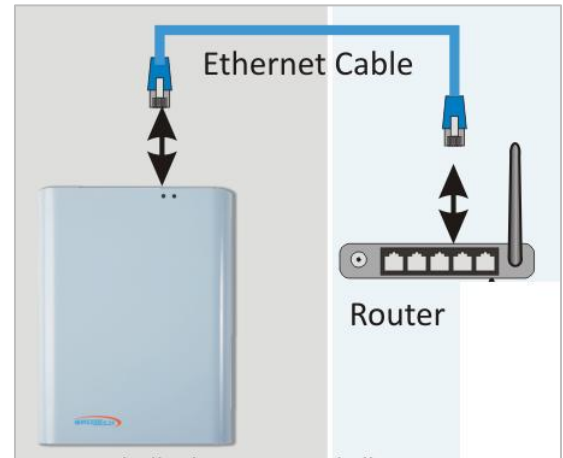


Figure 21 Ethernet cable connects the GEM to the router

ETHERNET CONNECTION TO THE NETWORK

If the GEM's WiFi/Ethernet module is set to its factory default values, connecting it to a router via Ethernet cable will allow the router to detect the GEM and assign it an IP address on the network.

1. Plug an Ethernet cable between the RJ-45 jack on the GEM and your network router
2. Make sure the GEM is powered up. The communication LED should be orange

The GEM should now be connected to the network.

Proceed to the next chapter.

DISCOVER GEM'S IP ADDRESS

At this point, the GEM is connected to your network either via **WiFi** or **Ethernet cable**.

There are many options for discovering the GEM's IP address. Two of them are explained in this chapter. Additional options are described in **Appendix A**.

Windows OS: Download and install the **Brultech Device Discovery** program from:

"https://www.brultech.com/software/files/downloadSoft/Brultech_Device_Discovery_130.exe"

iOS, Android, Linux or Mac: Non-Windows system or smart phone you can use the free "**Fing**" app.

Fing for Windows, Linux and OSx: <https://www.fing.io/download-free-ip-scanner-desktop-linux-windows-osx/>

Fing for iOS and Android: <https://www.fing.io/>

Windows User

1. Install and run the Brultech Device Discovery program (Figure 22).
2. Click "Search"(1).
3. Double-click "GEM Network Setup"(2) from the found devices.
4. Once the browser opens, use "**admin**" for both the **User** and **Password**.

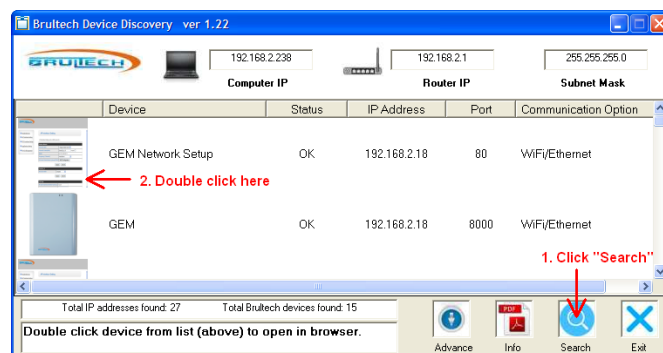


Figure 22 Brultech Device Discovery program

Non-Windows User

1. Install and run the "**Fing**" app (Figure 23).
2. Connect you PC, tablet or phone to the same network the GEM is connected to.
3. Perform a network scan using Fing.
4. Look for a device with MAC address beginning with "**AC:CF:**" or with the name "**Hi-flying Electronics Tech**". Make note of the IP address for this device.
5. Open a browser and enter the IP address.
6. When prompted for "**User**" and "**Password**", use "**admin**" (case sensitive) for both.

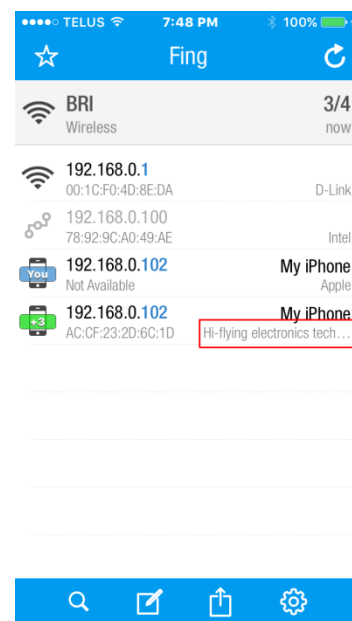


Figure 23 Network scan using Fing app

CONNECT TO DASHBOX

If you are connecting to a data host other than the DashBox, skip this chapter and proceed to “Connect to Data Host”

DISCOVER DASHBOX IP ADDRESS

If it’s not feasible to connect the GEM to the DashBox using RS-232 communication then the next option is to connect using **WiFi** or **Ethernet cable**.

The DashBox manual describes how to find the IP address for the DashBox. Ideally the DashBox has been set with a “**static**” address meaning that the router will not change this IP address.

If you have installed the **Brultech Device Discovery** program you may use it to discover the DashBox’s IP address. If you used the “**Fing**” app you may use it also. Other options are described in **Appendix A**.

Fing

Figure 24 shows a scan done using the free “**Fing**” app running on an iPhone. Notice that a DashBox was discovered and the IP is listed on the left (192.168.2.79) in this case. The port used to send data to the DashBox is port “**80**”.

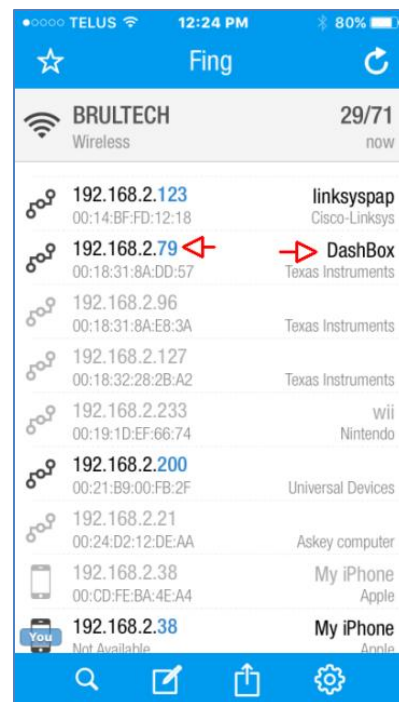


Figure 24 Network scan using Fing app

Device Discovery program

Figure 25 shows a “Search” done using the free “**Brultech Device Discovery**” program.

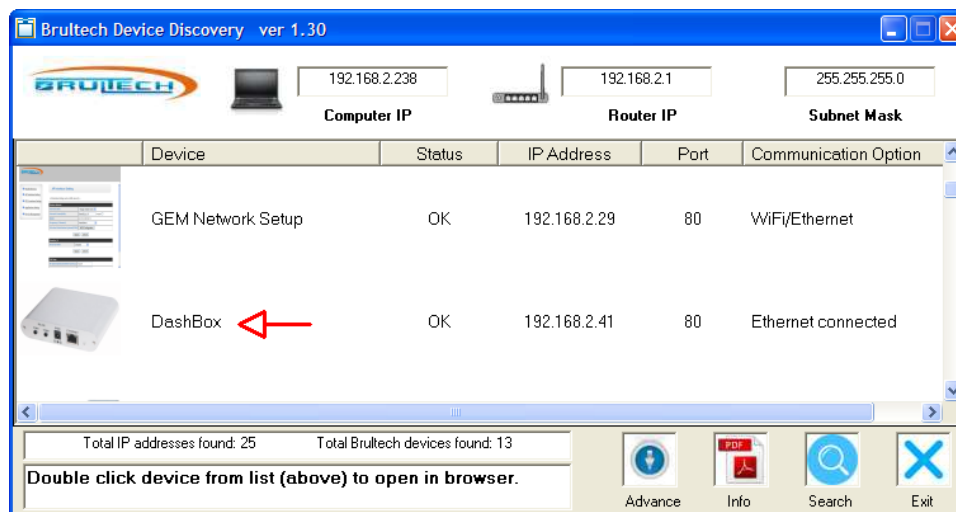


Figure 25 Brultech Device Discovery program

SEND DATA FROM GEM TO DASHBOX

We now need to configure the GEM so that it has the following information:

- IP address of the DashBox
- Packet format and send interval to the DashBox
- Data post header information

1. If you are using the “**Brultech Device Discovery**” program (Figure 26), click “**Search**” then double click the GEM device that was found. A browser will automatically open. If using “**Fing**” then open a browser, enter the GEM’s IP address and add the suffix “**:8000**” to access the GEM Setup page via port **8000**. Ex: “**192.168.2.23:8000**”.
2. Enter the setup page and click “**Network**” from the menu (Figure 27).

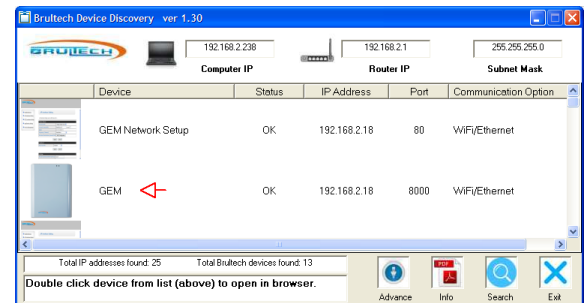


Figure 26

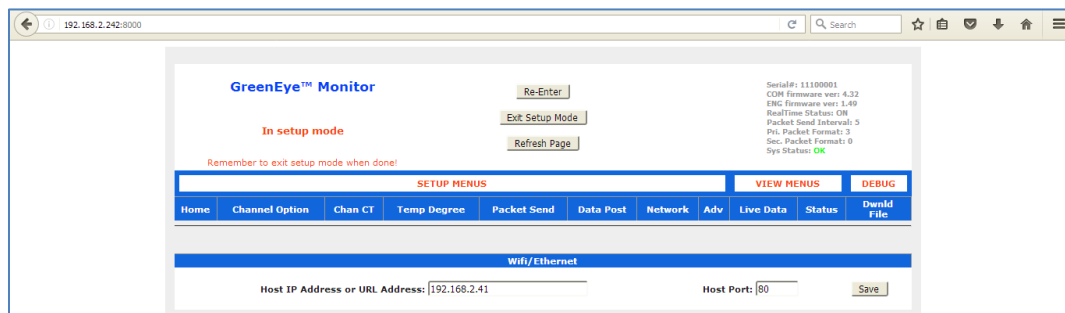


Figure 27

3. Enter the IP Address for the “**DashBox**” which was obtained in step 1. Enter “**80**” as the port number. Click “**Save**”. Wait 30 seconds. The GEM data is now sent to the DashBox from the GEM.
4. Re-Enter the GEM setup page. Click “**Packet Send**” from the menu. Make sure that it is configured for the following:
 - a. Realtime = “**on**”.
 - b. Primary Packet Format = “**3. HTTP GET**”.
 - c. Packet Send interval “**5**” or greater.
5. If you modified any of the above parameters, click “**Save**”.
6. Select “**Data Post**” from the menu. Click the “**DashBox / Standalone Software**” button.
7. Enter the DashBox IP address in the “**URL Address**” field.
8. Leave the “**URL Extension**” with the preset value
9. Click “**Save**”

This completes the setup. The GEM is now sending packets to the DashBox over the network.

CONNECT TO DATA HOST

If you are using a DashBox webserver skip this chapter.

WHAT IS A DATA HOST?

The “**Data Host**” is the device or website that will receive packets from the GEM. You can make the comparison of a Data Host to a network printer. When your PC sends a document to your network printer, it needs to know the printer’s IP Address and Port. This was done when you initially setup the printer. The same principle applies here. The GEM send energy data instead of printer data and the Data Host stores the data information whereas the printer prints it.

Data Hosts Examples

1. **DashBox** Webserver (Brultech)
2. **Standalone Software** (free from Brultech) running on a local **Computer**
3. “**BTmon**” running on a **local PC** or **Single Board Computer (SBC)**. **BTmon** is free courtesy of Matthew Wall who has done an excellent job! This option is for more computer savvy people.
<http://lancet.mit.edu/mwall/projects/power/btmon-howto.html>
4. **Emoncms** running on a **local PC** or **Single Board Computer (SBC)** such as Raspberry Pi or running on a **remote web site**. This is an open source program which requires computer savvy.
<https://github.com/emoncms/emoncms>
5. Hosting site such as <http://mysolarstats.com> or <http://smartenergygroups.com> There is a charge for these services.

Although the GEM is now connected to the network, it needs to send its packet data to a specific device on the network or over the internet. This requires knowing the **IP address** or **URL** of the host device including the **port** used. If you have a system which includes a DashBox, we would set the **IP address** and **port** to that of the DashBox.

Data Host

If you are sending data to a third party host over the internet, contact the host to acquire their URL. For example “**smartenergygroups.com**” requires data packet to be sent to “**api.smartenergygroups.com**”.

If you are using a local computer to host, you can use any of the four options listed in **Appendix A** find the host computer’s IP address or go to the host computer and view its IP address from its network settings.

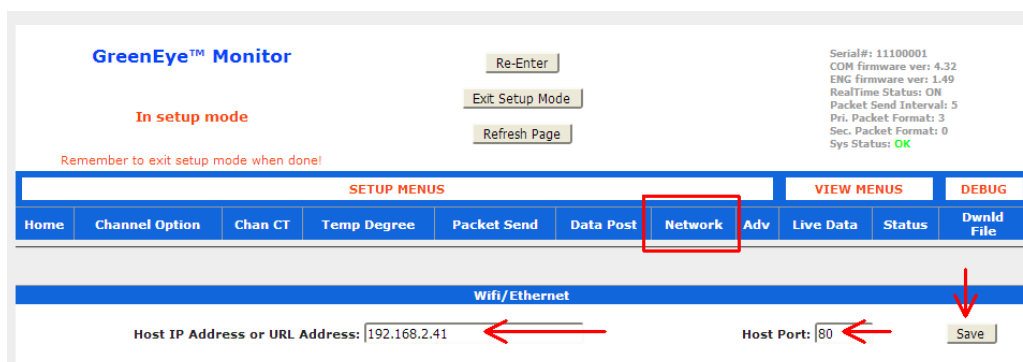
SETTING IP AND PORT

At this point, you should have the IP address of the host. The port will be Port 80 for almost all situations.

Setting the IP of the data host can only be done using the GEM setup page. Accessing the GEM setup page has been described in the previous chapter.

Refer to the screenshot below to set the IP address (or URL) and port.

1. Open the GEM setup page
2. Click **"Network"** from the menu (Figure 28)
3. Enter the IP address or URL in the corresponding field. In this example it is **"192.168.2.41"**. If you are sending to **"api.hostsite.com"** (fictional site), you would enter **api.hostsite.com** in this field.
4. Enter the port number. This is typically port **80** especially if sending data over the internet
5. Click **"Save"** and wait approximately 30 seconds



GreenEye™ Monitor

Re-Enter

Exit Setup Mode

Refresh Page

Serial#: 11100001
COM firmware ver: 4.32
ENG firmware ver: 1.49
RealTime Status: ON
Packet Send Interval: 5
Pri. Packet Format: 3
Sec. Packet Format: 0
Sys Status: OK

In setup mode

Remember to exit setup mode when done!

SETUP MENU

VIEW MENU

DEBUG

Home Channel Option Chan CT Temp Degree Packet Send Data Post Network Adv Live Data Status Dwnld File

Wifi/Ethernet

Host IP Address or URL Address: 192.168.2.41

Host Port: 80

Save

Figure 28

This will cause the GEM to direct packets to your data host. The GEM manual explains how to configure the **"Packet Send"** and **"Data Post"** for the specific data host used.

1. Re-Enter the GEM setup page. Click **"Packet Send"** from the menu. Make sure that it is configured for the following:
 - a. Realtime = **"on"**.
 - b. Primary Packet Format = (dependent on data host requirement)
 - c. Packet Send interval **"5"** or greater.
2. If you had to modify any of the above parameters, click **"Save"**.
3. Select **"Data Post"** from the menu. Click the **"DashBox / Standalone Software"** button.
4. Enter the DashBox IP address in the **"URL Address"** field.
5. Leave the **"URL Extension"** with the preset value
6. Click **"Save"**

This completes the setup.

ADDITIONAL SECURITY OPTIONS

DISABLE AP

You have the option to disable the AP completely when connected to the network using WiFi. Although this is not recommended, it may be needed in certain situations.

This option is only functional if you are connected to the network using WiFi. It allows you to disable the Access Point altogether. **This option should only be used in extreme cases and generally not recommended!**

If you choose to disable the AP mode, you will not be able to connect to the GEM's Access Point any longer until a factory reset is done which will reset all your network connections settings.

1. Connect to the GEM Setup Page. This is different than the WiFi/Ethernet setup page accessed previously. This is done by using the same IP address in your browser and adding “:8000” at the end of the address. For example if the browser was set to IP address was <http://192.168.1.45>, use <http://192.168.1.45:8000>. You should get the screen shown in Figure 29. You may need to refresh the browser a couple of times.

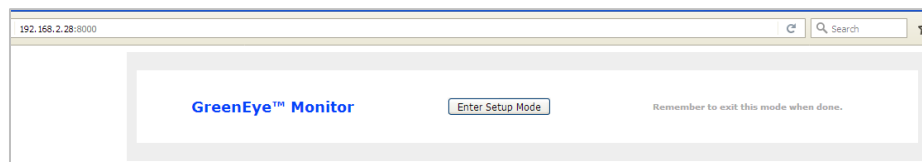


Figure 29

2. Click “Enter Setup Mode”. The page should look like Figure 30.



Figure 30

- Click **“Adv”** (Advance) from the menu

COM1 Port Options		COM2 Port Options	
<input type="button" value="Save"/>	COM1 Baud: <input type="radio"/> 19200 <input checked="" type="radio"/> 115200	<input type="button" value="Save"/>	COM2 Baud: <input checked="" type="radio"/> 19200 <input type="radio"/> 115200
<input type="button" value="Save"/>	COM1 Flow: <input checked="" type="radio"/> Disable <input type="radio"/> Enable	<input type="button" value="Save"/>	COM2 Flow: <input checked="" type="radio"/> Disable <input type="radio"/> Enable (Disabled Recommended)
<input type="text" value="0"/> <input type="button" value="Save"/>	COM1 Auto Reset Timer (0=OFF, max 255)(time = value x 16 sec)	<input type="text" value="0"/> <input type="button" value="Save"/>	COM2 Auto Reset Timer (0=OFF, max 255)(time = value x 16 sec)
<input type="text" value="0"/> <input type="button" value="Save"/>	COM1 No Response Counter (0=OFF, min 12, max 255)	<input type="text" value="0"/> <input type="button" value="Save"/>	COM2 No Response Counter (0=OFF, min 2, max 255)
Date and Time			
Y/M/D: <input type="text" value="17"/> <input type="text" value="10"/> <input type="text" value="09"/> H/M/S: <input type="text" value="12"/> <input type="text" value="56"/> <input type="text" value="21"/> <input type="button" value="Get Local Date"/> <input type="button" value="Get UTC Date"/> <input type="button" value="Save Date to GEM"/>			
Caution			
<input type="button" value="off"/> AP off		<input type="button" value="on"/> AP on	
Setup Password			
<input type="text"/> <input type="button" value="Save"/> Setup Page Password (6 characters) (Letters and numbers only!)		<input type="button" value="Save"/> Setup Pwd <input checked="" type="radio"/> Disable <input type="radio"/> Enable	
"Live Data" and "Chan CT" Option			

Figure 31

- Click **“Off”** button next to the **“AP Off”** setting (Figure 31).

TROUBLESHOOTING

ACCESS POINT (AP)

Cannot see "GreenEye_xx" when looking for wireless network.

Remember that the "xx" after "GreenEye_" may be any two characters representing a HEX value and will not be "xx"

- You are out of the GEM WiFi range. Move your computer/tablet/phone closer to the GEM and search again.
- Antenna not installed or damaged
- Channel conflict with other WiFi access point. Cycle power to the GEM to allow it to find a quiet channel.
- The SSID for the Access Point was changed or the AP was set to "Hidden". Reset WiFi/Ethernet to factory defaults.
- AP has been disabled in the "ADV" (advanced) section of the GEM setup page. Connect to the GEM, access the GEM Setup page, select "ADV" from the menu, click "AP on" button. If you cannot connect to the GEM over the network, you may need to reset to factory defaults to connect to the AP.

WiFi CONNECTION TO NETWORK

Site search does not show desired network

- Router's WiFi signal is out of range with the GEM
- Too many WiFi access points detected. The site survey will list the networks in order of channel numbers. There are two options to resolve the issue:
 - Manually enter "SSID", security, etc.
 - Access the router and set it to use WiFi channel 1

No WiFi connection to the router.

- You are using the wrong security type to connect to the router.
- Verify the Pass Phrase (password). Remember that it is case sensitive.
- If using TKIP algorithm, try AES or vice versa.
- The router has been configured to allow connection with devices of specified MAC address. Connect to the router setup and investigate.

ETHERNET

No Ethernet connection to the router.

By default, the GEM is set to DHCP which means it will wait for the router to assign an IP address.

- Defective Ethernet cable or not plugged in all the way. Routers have LEDs indicating Ethernet connection for each Ethernet jack. If the LED is dark, try a different router channel or Ethernet cable.
- If the router LED for the channel you are using is active then perhaps there is a problem with DHCP. Try assigning a static IP address. In the setup page, select "STA Interface Setting" from the left menu. Select "Static (fixed IP)" from the drop-down menu. Enter your router's IP address in the "Default Gateway" and "DNS" fields. Use "255.255.255.0" for the "Subnet Mask". For "IP Address" use the first three octet as your router then use a high value below 254 as the fourth octet. For example if your router's IP is "192.168.1.1" then set your IP address to "192.168.1.99". Don't forget to "Save" and "Restart" after changing those settings.

TCP/IP

The Data Host device is not receiving packets

- Verify that the GEM is sending packets. The red system LED should flash briefly at whatever packet send interval the GEM is set to (typically 5 or 8 seconds). If there is no red flash then realtime is turned off or the GEM is stuck in setup mode. If stuck in setup mode you can cycle power to the GEM and it will begin sending packet after 30 seconds of reboot.
- If the GEM is sending packets as indicated by the brief red LED flash at regular interval, then you may be lacking a TCP/IP connection. This may be due to using an improper IP address or port.

APPENDIX A

FIND THE GEM'S IP ADDRESS

Once you are connected to the network, you will need to determine your GEM's IP address. Four different options are shown here. The option you choose depends on your OS and your knowledge of accessing your router. Here are four options although there are other programs out there that may be used.

1. **"Device Discovery"** program Windows based program. Free download from www.brultech.com/software
2. **"GEM Network Utility"** program Windows based program. Free download from www.brultech.com/software
3. **"Fing"** app for iOS, Android and Mac. Free download from www.fing.io
4. Connect to your network **router's setup page** and list devices connected to it.

1. Using "Device Discovery" Program

7. Install and run the Brultech Device Discovery program (Figure 32).
8. Click "Search"
9. Double-click "GEM Network Setup" from the found devices
10. Once the browser opens, use **"admin"** for both the **User** and **Password**

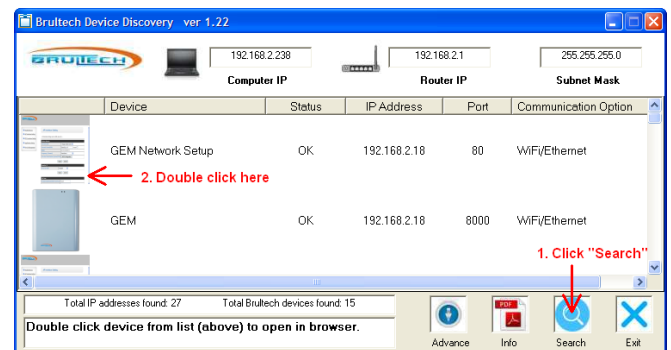


Figure 32

2. Using "GEM Network Utility" Program

1. Install and run the GEM Network Utility program (Figure 33).
2. Select the "Network" tab
3. Click "Search"
4. Double-click "GEM WiFi/Ethernet Network Setup" from the found devices
5. Once the browser opens, use **"admin"** for both the **User** and **Password**

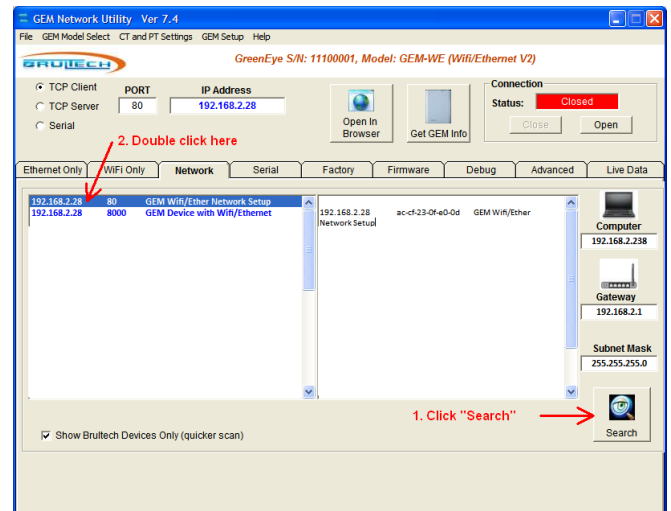


Figure 33

3. Using “Fing” App

1. Install and run the “Fing” app (Figure 34).
2. Make sure your device is connected to the same network as the GEM
3. Perform a network scan by clicking the icon on the top right of the Fing screen
4. Look for a device with a Mac address beginning with “AC:CF” or for device manufacturer name “Hi-flying electronics technology”
5. Enter this IP address in a browsers’ address field. You may need to include the prefix “<http://>”. For example “<http://192.168.2.28>” in this example
6. Once the browser opens the page, use “admin” for both the **User** and **Password**

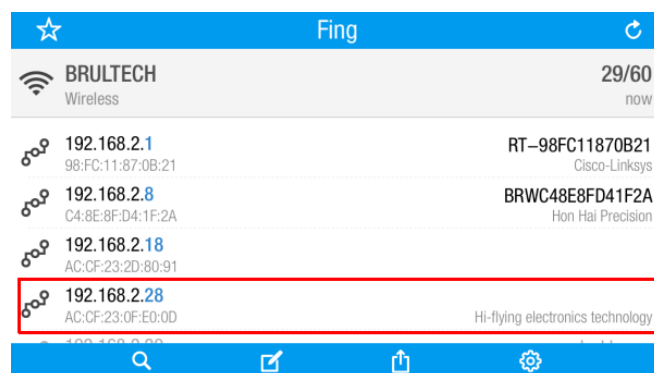


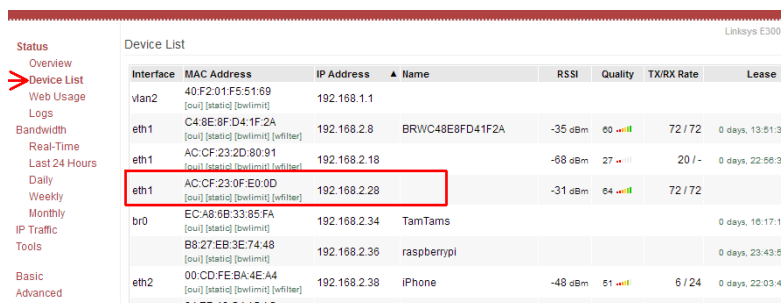
Figure 34

Fing for Windows, Linux and OSx: <https://www.fing.io/download-free-ip-scanner-desktop-linux-windows-osx/>

Fing for iOS and Android: <https://www.fing.io/>

4. Using your network router

1. Open your router’s setup page (Figure 35)
2. Look for a device with a Mac address beginning with “AC:CF” or for device manufacturer name “Hi-flying electronics technology”. Make note of the IP address associated with this device.
3. Enter this IP address in a browser’s address field. You may need to include the prefix “<http://>”. For example “<http://192.168.2.28>” in this example
4. Once the browser opens the page, use “admin” for both the **User** and **Password**



Interface	MAC Address	IP Address	Name	RSSI	Quality	TX/RX Rate	Lease
vlan2	40:F2:01:F5:51:69	192.168.1.1					
eth1	C4:8E:8F:D4:1F:2A	192.168.2.8	BRWC48E8FD41F2A	-35 dBm	60	72 / 72	0 days, 13:51:33
eth1	AC:CF:23:2D:80:91	192.168.2.18		-68 dBm	27	20 / -	0 days, 22:56:38
eth1	AC:CF:23:0F:E0:0D	192.168.2.28		-31 dBm	64	72 / 72	
br0	EC:A8:6B:33:85:FA	192.168.2.34	TamTams				0 days, 10:17:14
	B8:27:EB:3E:74:48	192.168.2.36	raspberrypi				0 days, 23:43:58
eth2	00:CD:FE:BA:4E:A4	192.168.2.38	iPhone	-48 dBm	51	6 / 24	0 days, 22:03:41
	84:FR:1R:C4:A5:AC						

Figure 35

GEM AND COMMUNICATION SETUP PAGES

The GEM has a separate setup page for the **Communication Module** and the **GEM parameters**. Once the GEM is connected to the network and its IP address is determined, you can access either page as follows:

Assume the GEM IP address is 192.168.1.45

- Entering “192.168.1.45” in a browser’s address bar will open the **Communication Module’s setup page**.
- Entering “192.168.1.45:8000” in a browser’s address bar will open the **GEM parameter setup page**.

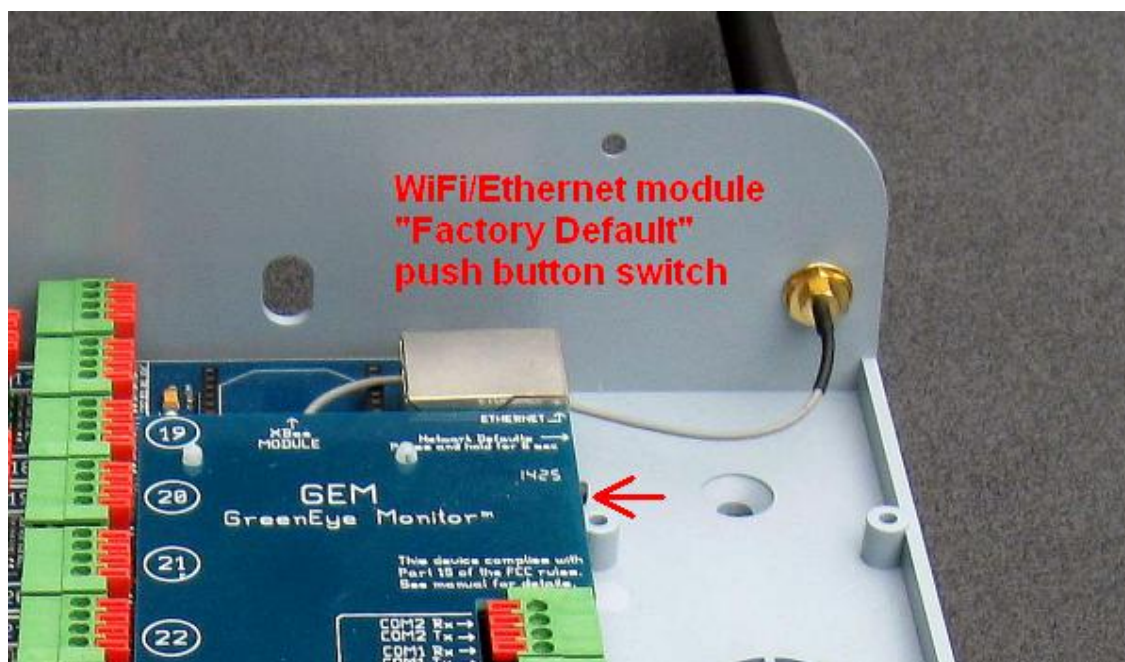
The same IP address is used for both with the difference being that one uses port 8000

APPENDIX B

SETTING WiFi/ETHERNET TO FACTORY DEFAULTS

A new GEM will have the factory defaults. If in doubt you may set the module to its default parameters using the following steps:

1. Plug the 5Vdc supply into the GEM. It makes no difference if the PT or CTs are connected at this point
2. Once powered up with both GEM LEDs “on”, press and hold the WiFi/Ethernet factory default push button located next to the Ethernet jack. (refer to figure 1 above) Hold for approximately 5 seconds and release
3. Wait for approximately 30 seconds for the settings to take place and module to re-boot



Please be aware that setting the factory defaults will change all of the settings to a set value. If you have previously setup the GEM and perform a factory reset, you will need to follow the steps in this manual to re-connect.